National Institute of Environmental Health Sciences

The effects of temperature and use of air conditioning on hospitalizations

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Abstract:

Several investigators have documented the effect of temperature on mortality, although fewer have studied its impact on morbidity. In addition, little is known about the effectiveness of mitigation strategies such as use of air conditioners (ACs). The authors investigated the association between temperature and hospital admissions in California from 1999 to 2005. They also determined whether AC ownership and usage, assessed at the zip-code level, mitigated this association. Because of the unique spatial pattern of income and climate in California, confounding of AC effects by other local factors is less likely. The authors included only persons who had a temperature monitor within 25 km of their residential zip code. Using a time-stratified case-crossover approach, the authors observed a significantly increased risk of hospitalization for multiple diseases, including cardiovascular disease, ischemic heart disease, ischemic stroke, respiratory disease, pneumonia, dehydration, heat stroke, diabetes, and acute renal failure, with a 10 degrees F increase in same-day apparent temperature. They also found that ownership and usage of ACs significantly reduced the effects of temperature on these health outcomes, after controlling for potential confounding by family income and other socioeconomic factors. These results demonstrate important effects of temperature on public health and the potential for mitigation.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Indoor Environment, Meteorological Factors, Temperature, Other Exposure

Temperature: Extreme Heat, Fluctuations

Other Exposure: apparent temperature

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Diabetes/Obesity, Injury, Respiratory Effect, Urologic Effect, Other Health Impact

Cardiovascular Effect: Heart Attack, Stroke, Other Cardiovascular Effect

Cardiovascular Disease (other): heart failure

Respiratory Effect: Asthma, Bronchitis/Pneumonia, Chronic Obstructive Pulmonary Disease

Other Health Impact: dehydration; heat stroke; intestinal infectious diseases

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Elderly, Low Socioeconomic Status

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified